UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,002	12/14/2001	Robert P. Bourdelais	83613AEK	1246

7590 03/22/2004

Paul A. Leipold
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER	
PATTERSON, MARC A	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,002	BOURDELAIS ET AL.	
	Examiner	Art Unit	
	Marc A Patterson	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/12/04*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18,20 and 23-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,20 and 23-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

WITHDRAWN REJECTIONS

1. The 35 U.S.C. 112 second paragraph rejection of Claims 6 and 19 – 22, of record on page 2 of the previous Action, are withdrawn.

The 35 U.S.C. 103(a) rejection of Claims 1 – 6, 8 – 9 and 11 – 31 as being unpatentable over Aylward et al (U.S. Patent No. 6,017,686) in view of Harrison et al (U.S. Patent No. 5,100,862).

The 35 U.S.C. 103(a) of Claims 7 and 10 as being unpatentable over Aylward et al (U.S. Patent No. 6,017,686) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Bourdelais et al. (U.S. Patent No. 6,326,109).

NEW REJECTIONS

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 3, 5 – 6, 9, 11 – 13, 15 – 16, 20, 23 and 28 – 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862).

With regard to Claims 1 – 2, 12 and 20 Ouderkirk et al disclose a liquid crystal device (comprising liquid crystals; column 11, line 55) comprising a light source which provides light at

450 – 700 nm (therefore providing light at 500 nm; column 29, line 21) and a diffuser (a layer which causes diffuse transmission; column 15, line 40) comprising a thermoplastic layer (column 32, lines 62 – 63) incorporating microvoids (at the interface between a continuous phase and disperse phase; column 16, lines 51 – 55; column 16, line 51) which contain beads (a spherical disperse phase, therefore having a major axis diameter to minor axis diameter ratio of 1.0; column 10, lines 41 – 43) which are organic (polymeric materials; the microvoids are therefore formed by organic microsphreres; column 13, lines 12 – 14); the device also comprises a non – voided layer on the surface of the microvoided layer (a skin layer; column 15 lines 44 – 46); the thickness of the skin layer is 2 – 50% of the thickness of the voided layer, which is 16.3 microns (Table 2, column 25, lines 31 – 35); the thickness of the non – voided layer is therefore less than 12 microns. Ouderkirk et al fail to disclose a non – voided layer which is a smoothing layer.

However, Harrison et al teach that a non – voided layer on a surface of a layer containing microvoids is a smoothing layer (column 2, lines 46 – 66); therefore, one of ordinary skill in the art would recognize that the non – voided layer of Ouderkirk et al is inherently a smoothing layer, as it is a non – voided layer on a surface of a layer containing microvoids as taught by Harrison et al.

Ouderkirk et al also fail to disclose a diffuse light transmission of at least 65% and a light transmission efficiency of greater than 80%. However, Ouderkirk et al disclose a diffuse light transmission of at least 40% (at least 40% of the light is diffusely transmitted; column 34, lines 6 – 8) and a light transmission efficiency of greater than 70% (at least 70% of the light is transmitted; column 32, lines 50 – 53), depending on the thickness of the layer (column 12, lines 30 – 33). Therefore one of ordinary skill in the art would have recognized the utility of varying

the thickness of the layer to obtain a desired range of diffuse light transmission greater than 40% and range of light transmission efficiency greater than 70%. Therefore, the diffuse light transmission and light transmission efficiency would be readily determined through routine optimization of thickness by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the thickness in order to obtain a desired diffuse light transmission and light transmission efficiency, since the diffuse light transmission and light transmission efficiency would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Ouderkirk et al, in the absence of unexpected results. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

With regard to Claim 3, the smoothing layer is a polyester polymer (polyethylene naphthalate; column 16, lines 18 – 20).

With regard to Claim 5, the thickness of the skin layer disclosed by Ouderkirk et al is 2 – 50% of the thickness of the voided layer, which is 16.3 microns (Table 2, column 25, lines 31 – 35); it would therefore be obvious for one of ordinary skill in the art to select a thickness between 2 and 12 micrometers, as this thickness is within the range disclosed by Ouderkirk et al.

With regard to Claim 6, the smoothing layer is contained on both external surface of the layer (both major surfaces; column 15, lines 44 – 46).

With regard to Claim 9, Ouderkirk et al fail to disclose a smoothing layer having a %light transmission of between 94 and 99.6%. However, as stated above, Ouderkirk et al disclose a diffuse light transmission of at least 40% (at least 40% of the light is diffusely transmitted;

column 34, lines 6 – 8) and a light transmission efficiency of greater than 70% (at least 70% of the light is transmitted; column 32, lines 50 – 53), depending on the thickness of the layer (column 12, lines 30 – 33). Therefore one of ordinary skill in the art would have recognized the utility of varying the thickness of the layer to obtain a desired range of diffuse light transmission greater than 40% and range of light transmission efficiency greater than 70%. Therefore, the diffuse light transmission and light transmission efficiency would be readily determined through routine optimization of thickness by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the thickness in order to obtain a desired diffuse light transmission and light transmission efficiency, since the diffuse light transmission and light transmission efficiency would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Ouderkirk et al, in the absence of unexpected results. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

With regard to Claims 11 and 23, Ouderkirk et al teach that the difference in refractive index between the polymeric material and microvoids of microvoided films is greater than 0.2 (0.5; column 2, lines 66 – 67; column 3, lines 1 – 2). Ouderkirk et al also teach that the device contains nine layers (column 17, lines 43 – 45) and therefore contains nine changes in index of refraction greater than 0.2 parallel to the direction of light travel.

With regard to Claim 13, the microvoids disclosed by Ouderkirk et al disclose organic polymeric material (polyethylene naphthalate; column 13, lines 21 – 22) and are therefore free of any inorganic particles.

With regard to Claim 15, the microvoids disclosed by Ouderkirk et al contain a gas (column 16, lines 58 – 59).

With regard to Claim 16, Ouderkirk et al disclose no surface non – uniformity; the claimed aspect of the thickness uniformity across the diffuser being less than 0.10 micrometers therefore reads on Ouderkirk et al.

With regard to Claim 28, the thermoplastic layer disclosed by Ouderkirk et al comprises polyolefin polymer (polypropylene copolymer; column 14, lines 10 – 14).

With regard to Claim 29, the thermoplastic layer disclosed by Ouderkirk et al comprises polyester (column 13, lines 21 – 22).

4. Claims 4, 8, 14, 24 – 27, 30 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Aylward et al (U.S. Patent No. 6,017,686).

Ouderkirk et al and Harrison et al disclose a light diffuser comprising a microvoids and a smoothing layer and organic beads as discussed above. With regard to Claims 4, 24 – 27 and 30 – 31, Ouderkirk et al and Harrison et al fail to disclose a light diffuser comprising a smoothing layer which comprises polyolefin polymer and microvoids having an average volume between 12 and 18 cubic micrometers over an area of 1 square centimeter and a thickness of between 12.5 and 50 micrometers and a thermoplastic layer which comprises polyolefin polymer and organic beads having a particle size between 0.30 and 1.7 micrometers.

Aylward teach the use of a smoothing layer which comprises polyolefin (column 5, lines 9 – 12) and light diffuser (layer which diffuses light; column 3, lines 28 – 30) and microvoids

having an average volume between 12 and 18 cubic micrometers over an area of 1 square centimeter (the voids are initiated by particles having a diameter, therefore a particle size, of between 0.1 to 10 micrometers; column 4, line 50 – 55) and a thickness of between 12.5 and 50 micrometers (column 4, lines 43 – 44) and a thermoplastic layer which comprises polyolefin (column 5, lines 9 – 12) for the purpose of obtaining a light diffuser having a spectral transmission of at least 40% (column 9, lines 17 – 18). Therefore, one of ordinary skill in the art would have recognized the advantage of providing for a smoothing layer which comprises polyolefin polymer and microvoids having an average volume between 12 and 18 cubic micrometers over an area of 1 square centimeter and a thickness of between 12.5 and 50 micrometers and a thermoplastic layer which comprises polyolefin polymer and organic beads having a particle size between 0.30 and 1.7 micrometers in Ouderkirk et al and Harrison et al, which is a light diffuser, depending on the desired spectral transmission of the end product as taught by Aylward et al.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a smoothing layer which comprises polyolefin polymer and microvoids having an average volume between 12 and 18 cubic micrometers over an area of 1 square centimeter and a thickness of between 12.5 and 50 micrometers and a thermoplastic layer which comprises polyolefin polymer and organic beads having a particle size between 0.30 and 1.7 micrometers in Ouderkirk et al and Harrison et al in order to obtain a light diffuser having a spectral transmission of at least 40% as taught by Aylward et al.

With regard to Claim 8, Aylward et al fail to disclose a diffuser having a surface roughness of between 0.02 and .18 micrometers. However, Aylward et al teach a smoothing layer having a surface roughness of less than 44 micrometers (a smooth surface is defined as one having a surface roughness less than 44 micrometers; column 11, lines 1 – 11). Therefore, one of ordinary skill in the art would have recognized the utility of varying the surface roughness to obtain a desired range surface roughness less than 44 micrometers. Therefore, surface roughness would be readily determined through routine optimization of thickness by one having ordinary skill in the art depending on the desired smoothness of the smoothing layer of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the surface roughness in order to obtain a desired surface roughness, since the surface roughness would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired smoothness of the final smoothing layer as shown by Ouderkirk et al, in the absence of unexpected results. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

With regard to Claim 14, the particles disclosed by Aylward et al are crosslinked (column 5, lines 44 – 45) and are polymer beads (spherical particles; column 5, lines 5 – 10).

5. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Bourdelais et al. (U.S. Patent No. 6,326,109).

Ouderkirk et al and Harrison et al disclose an optical layer comprising a smoothing layer as discussed above. With regard to Claims 7 and 10, Ouderkirk et al and Harrison et al fail to disclose an optical layer comprising a crosslinked urethane polymer coating applied to the

Wu et al teach a light diffuser (light diffusing polymer; column 1, line 54) having an elastic modulus greater than 500 megapascals (1400 to 3500 megapascals; column 11, lines 65 – 67) for the purpose of obtaining a light diffuser which does not crystallize under use conditions (column 11, lines 57 – 59). Therefore, one of ordinary skill in the art would recognize the advantage of providing for an elastic modulus greater than 500 megapascals in Ouderkirk et al and Harrison et al, which is a light diffuser polymer, depending on the desired resistance to crystallinity during use of the final product as taught by Wu et al.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for an elastic modulus greater than 500 megapascals in Ouderkirk et al and Harrison et al in order to obtaining a light diffuser which does not crystallize under use conditions, depending on the desired resistance to crystallization of the diffuser, as taught by Wu et al

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and Aylward et al (U.S. Patent No. 6,017,686) and Yamamoto et al (U.S. Patent No. 5,502,011).

Ouderkirk et al, Harrison et al and Aylward et al disclose a light diffuser comprising a polymer layer as discussed above. The polymer comprises ceramic beads (column 6, line 5 of Aylward et al). Ouderkirk et al, Harrison et al and Aylward et al fail to disclose a polymer layer having an impact resistance of greater than 0.6 GPa.

Yamamoto et al teach that it is well known in the art to use a ceramic having an impact resistance greater than 0.6 GPa (15 GPa; column 4, line 66) for the purpose of obtaining a

ceramic having improved mechanical properties (column 2, line 64 – 65). Therefore, one of ordinary skill in the art would recognize the advantage of providing for an impact resistance of greater than 0.6 GPa for the ceramic bead in Ouderkirk et al, Harrison et al and Aylward et al, depending on the mechanical properties of the desired end product as taught by Yamamoto et al.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for an impact resistance of greater than 0.6 GPa in Ouderkirk et al, Harrison et al and Aylward et al in order to obtain a ceramic having improved mechanical properties depending on the desired end properties of the end product as taught by Yamamoto et al.

ANSWERS TO APPLICANT'S ARGUMENTS

8. Applicant's arguments regarding the 35 U.S.C. 112 second paragraph rejection of Claims 6 and 19 – 22, 35 U.S.C. 103(a) rejection of Claims 1 – 6, 8 – 9 and 11 – 31 as being unpatentable over Aylward et al (U.S. Patent No. 6,017,686) in view of Harrison et al (U.S. Patent No. 5,100,862) and 35 U.S.C. 103(a) of Claims 7 and 10 as being unpatentable over Aylward et al (U.S. Patent No. 6,017,686) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Bourdelais et al. (U.S. Patent No. 6,326,109), of record in the previous Action, have been considered and have been found to be persuasive. The rejections are therefore withdrawn.

The new 35 U.S.C. 103(a) rejection of Claims 1 – 3, 5 – 6, 9, 11 – 13, 15 – 16, 20, 23 and 28 – 29 as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862), 35 U.S.C. 103(a) rejection of Claims 4, 8, 14, 24 –

27, 30 – 31 as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Aylward et al (U.S. Patent No. 6,017,686), 35 U.S.C. 103(a) rejection of Claims 7 and 10 as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Bourdelais et al. (U.S. Patent No. 6,326,109), 35 U.S.C. 103(a) rejection of Claim 17 as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Wu et al (U.S. Patent No. 5,346,954) and 35 U.S.C. 103(a) rejection of Claim 18 as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and Aylward et al (U.S. Patent No. 6,017,686) and Yamamoto et al (U.S. Patent No. 5,502,011) above are directed to amended Claims 1 – 18, 20 and 23 – 31.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Patterson, whose telephone number is (703) 305-3537. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (703) 308-4251. FAX communications should be sent to (703) 872-9310. FAXs received after 4 P.M. will not be processed until the following business day.

Marc A. Patterson, PhD.
Marc Patterson
Art Unit 1772

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

3/15/04

surface of the smoothing layer and a pressure – sensitive adhesive applied to the surface of the smoothing layer.

Bourdelais et al teach the use of a urethane coating (column 7, lines 40 – 44) at the surface of an optical layer (photographic paper; column 1, lines 5 – 6) for the purpose of obtaining a layer which is protected from scratching (column 7, lines 40 – 44) and a pressure – sensitive adhesive for the purpose of adhering the layer to other optical layers (column 9, lines 4 – 8). Therefore, one of ordinary skill in the art would have recognized the advantage in providing for a urethane coating and pressure – sensitive adhesive in Ouderkirk et al and Harrison et al, depending on the desired scratch resistance and adhesion of the layer.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a urethane coating and pressure sensitive adhesive at the surface of Ouderkirk et al and Harrison et al, which is the smoothing layer of Ouderkirk et al and Harrison et al, in order to obtain a layer which is protected from scratching and to adhere the layer to other layers as desired, as taught by Bourdelais et al.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (U.S. Patent No. 5,825,543) in view of Harrison et al (U.S. Patent No. 5,100,862) and further in view of Wu et al (U.S. Patent No. 5,346,954).

Ouderkirk et al and Harrison et al disclose a light diffuser as discussed above. Ouderkirk et al and Harrison et al fail to disclose a light diffuser having an elastic modulus greater than 500 megapascals.